CLAIMS

1. A roller arrangement (7) for conveying piece goods (18) along a stowing roller conveyor (1), comprised of a stationary roller axle (20) arranged in a support frame (3) of the stowing roller conveyor (1); a driving roller (9) and a conveying roller (10) adapted to be driven and/or braked, if need be, rotationally mounted on said roller axle; as well as a mechanically actuated clutch system (12), particularly a friction clutch system arranged between said rollers (9) and (10), said clutch system comprising clutch components (14, 15) adjustable against one another via a setting device (13); whereby at least one of the clutch components (14, 15) is axially adjustable against the action of at least one spring element (36), from a switching position in which such component is engaged, into a switching position in which it is disengaged, and the first clutch component (14) is drive-connected with the conveying roller (10), and the other clutch component (15) with the driving roller (9); and coupling surfaces (43, 44) of the clutch components (14, 15), such surfaces facing each other, are supported against one another by a force of contact pressure in the switching position in which they are engaged, wherein a self-adjusting setting device (47) is arranged between the conveying roller (10) and the first clutch component (14) adjustable on the roller axle (20), said setting device comprising at least two transmitting elements (42, 48; 117, 118) engaged via a tooth system (49) and adjustable against one another in the axial and/or peripheral directions in relation to the roller axle (20); the first clutch component (14), in the presence of a relative movement between the conveying roller (10) and the first clutch component (14), is automatically adjusted toward the other clutch component (15) in the peripheral direction of said conveying roller, and in the axial direction relative to the roller axle (20); and the coupling surface (43) of the first clutch component (14) is pressed against the coupling surface (44) of the other clutch component (15) with a force of contact pressure set depending on the weight of the piece goods (18) transported by the conveying roller (10), until slip-free friction grip is reached between the two clutch components (14, 15).

2. The roller arrangement according to claim 1, wherein the first transmitting element (42; 118) is coupled or drive-connected with the first clutch component (14), and the second transmitting element (48; 117) with the conveying roller (10).

3. The roller arrangement according to claim 1 or 2, wherein the setting device (47) comprises mechanical transmitting elements (42, 48) engaged with one another via a tooth system (49), and adjustable against each other in the axial and peripheral directions in relation to the roller axle (20); and V-grooves (58) of the tooth system (49) extend at an angle relative to the roller axle (20) or to a radial plane extending perpendicular to the roller axle (20).

4. The roller arrangement according to any one of claims 1 to 3, wherein at least the first transmitting element (42) is coaxially arranged within the other transmitting element (48) connected fixed in motion with the conveying roller (10) adapted to be driven and/or braked, if necessary; and said elements are connected with and displaceable against one another via the tooth system (49) in the peripheral direction of the transmitting elements (42, 48), and in the axial direction relative to the roller axle (20).

5. The roller arrangement according to any one of claims 1 to 4, wherein the first transmitting element (42) is formed by a cylindrical basic body (50) with a through-extending opening (51) extending coaxially in relation to the roller axle (20), and is limited by two front sides (53, 54); and at least two, preferably four tooth elements (55a) equally spaced from each other, are arranged on the outer circumference (52) of the basic body (50).

6. The roller arrangement according to any one of claims 1 to 5, wherein the first transmitting element (42) is displaceably and/or rotationally supported on the roller axle (20), and connected fixed in motion with the first clutch component (14), particularly forming one piece with the latter.

7. The roller arrangement according to any one of claims 1 to 6, wherein the first clutch component (14) is axially displaceably supported on the roller axle (20) and connected fixed with the conveying roller (10) for moving with the latter via a tooth system (84a, 84b); and the transmitting elements (42, 48) engaging each other and being adjustable against one another in the axial and peripheral directions in relation to the roller axle (20), are supported against the first clutch component (14) by at least one pre-tensioned spring element (36), particularly a pressure spring.

8. The roller arrangement according to any one of claims 1 to 7, wherein at their front sides (54, 61) facing one another, the transmitting elements (42, 48) engaging each other are provided with at least two, preferably four tooth elements (55a, 55b) equally spaced from one another in the peripheral direction of the transmitting elements (42, 48), said tooth elements having V-flanks (58) ascending in the peripheral direction; and the at least one spring element (36) is arranged between the transmitting elements (42, 48), or between one of the transmitting elements (42; 48) and the first clutch component (14).

9. The roller arrangement according to any one of claims 1 to 8, wherein the tooth elements (55a) have V-flanks (58) extending in the direction of the roller axle (20) inclined in relation to each other, and slanted relative to the longitudinal center axis (56) of the roller axle (20).

10. The roller arrangement according to any one of claims 1 to 8, wherein the tooth elements (55a) have V-flanks (58) extending in the direction of the roller axle (20) parallel to one another and inclined relative to the longitudinal center axis (56) of the roller axle (20).

11. The roller arrangement according to any one of claims 1 to 10, wherein the other transmitting element (48) is formed by a hollow-cylindrical basic body (59) and, if need be, a bottom (62) arranged on one of its front sides (60, 61); the bottom (62) has a bore (63) extending coaxially with the roller axle (20); and twisted longitudinal grooves (65) are arranged recessed on the inner circumference (64) in the peripheral direction of the transmitting element (48), said grooves being equally spaced from one another and complementing the tooth elements (55a), and being limited peripherally.

12. The roller arrangement according to any one of claims 1 to 11, wherein the other transmitting element (48) is formed by a disk-like basic body (59), and a recess extending coaxially with the roller axle (20) is arranged in said basic body, with a bearing (30) for the conveying roller (10) being inserted in said recess; and the axially protruding tooth elements (55b) are formed on the front side (61) facing the first transmitting element (42).

13. The roller arrangement according to claim 11, wherein in the direction of the roller axle (20), the longitudinal grooves (65) have V-flanks (66) extending inclined against each

other and slanted toward the longitudinal center axis (56) of the roller axle (20).

14. The roller arrangement according to claim 11, wherein in the direction of the roller axle (20), the longitudinal grooves (65) have V-flanks extending parallel to one another and inclined toward the longitudinal center axis (56) of the roller axle (20).

15. The roller arrangement according to any one of claims 1 to 14, wherein the V-flank (58, 66) and the longitudinal center axis (56) or radial plane jointly enclose an angle (67) greater than 0°, particularly in the range of 5° and 50°, e.g. of 30°.

16. The roller arrangement according to claim 11, wherein the length (81) over which the transmitting elements (42, 48) cover each other, such elements being guided one in the other in the form of a screw line, corresponds with at least twice the amount, preferably a multiple amount of the axial distance over which the first clutch component (14), the latter being in driving connection with the other clutch component (15), is adjustable from a position in which it is engaged, into a position in which it is disengaged.

17. The roller arrangement according to claim 11 or 12, wherein the other transmitting element (48) has the shape of a pot and is forming on the bottom (62) a means for receiving the bearing (30) of the conveying roller (10).

18. The roller arrangement according to any one of claims 1 to 7, wherein at its front side (54) facing the other transmitting element (48), the first transmitting element (42) has a recess (69) extending coaxially with the roller axle (20) for receiving the spring element (36) in areas of said recess.

19. The roller arrangement according to any one of claims 1 to 18, wherein a brake system (72) is arranged between the conveying roller (10) or the other transmitting element (48), and the first transmitting element (42) displaceable on the roller axle (20), and/or the first clutch component (14); and the brake system (72) has a brake extension (73) and a braking block (74).

20. The roller arrangement according to claim 19, wherein the displaceable first trans-

mitting element (42) and/or the first clutch component (14) comprise the brake extension (73), the latter being engageable in friction grip with the braking block (74) seated fixed on the roller axle (20) and/or on an inner jacket surface of the conveying roller (10); and the brake extension (73) and the braking block (74) are provided with conical braking surfaces (75).

21. The roller arrangement according to claim 19 or 20, wherein the brake extension (73) forms a guide for the at least one spring element (36).

22. The roller arrangement according to any one of claims 1 to 19, wherein a switching element (27) slidingly supported and movable in the axial direction, and transmitting the switching force exerted by the setting device (13), is arranged on the roller axle (20); and the switching element (27) is supported against the first clutch component (14).

23. The roller arrangement according to any one of claims 1 to 22, wherein the first clutch component (14), the latter being joined with the first transmitting element (42) in the form of one piece with the latter, if need be, has a coupling surface (43) conically tapering in the direction of the driving roller (9); and the opening angle (45) amounts to between 5° and 50°, for example to 30°.

24. The roller arrangement according to any one of claims 1 to 23, wherein the driving roller (9) has a recess with a conically tapering coupling surface (44), said recess forming the other clutch component (15); and the opening angle (45) amounts to between 5° and 50°, for example to 30°.

25. The roller arrangement according to any one of claims 1 to 24, wherein the setting device (47) comprises mechanical transmitting elements (117; 118) engaged with one another via a tooth system (49), and adjustable against each other in the direction axial to the roller axle (20), as well as a third transmitting element (119) arranged coaxially with the roller axle (20); and on their front sides (54, 61) facing each other, the second and third transmitting elements (117, 119) disposed adjacent to one another, are designed at their front sides in the form of raceways (125), the latter being arranged recessed in said front sides and extending radially all around in a convex form, and having a cross-section in the

form of a circular arc, with each of said raceways facing the front side (54; 61) and being offset one against the other in the radial direction of the transmitting elements; and at least one adjustable sliding block (126) is arranged between said raceways in the radial direction.

26. The roller arrangement according to claim 25, wherein the first clutch component (14) is forming the first transmitting element (118), and comprises a ring bridge (122) with an outer tooth system extending parallel to the roller axle (20); the second transmitting element (117) has a hollow-cylindrical basic body with an inner tooth system (121) extending parallel to the roller axle (20); and the second transmitting element (117) is axially displaceably arranged on the first transmitting element (118).

27. The roller arrangement according to claim 25 or 26, wherein the at least one spring element (36) is arranged pre-tensioned between the first clutch component (14) and the second transmitting element (117).

28. A roller arrangement (7) for a stowing roller conveyor (1), comprising a stationary roller axle (20) arranged in a support frame (2) of the stowing roller conveyor (1); a driving roller (9) and a conveying roller (10) adapted to be driven and/or braked, if necessary, and rotationally supported on said roller axle; as well as a mechanical clutch system arranged between said driving and conveying rollers, said clutch system comprising clutch components (87, 88, 89) adjustable relative to one another via a setting device (13), wherein the first clutch component (87) is formed by the conveying roller (10) with a coupling surface (90) arranged concentrically in relation to the longitudinal center axis (56) of the roller ale (20); the second clutch component (88) is formed by the driving roller (9) or a driving roller (108) drive-connected to said roller (9); and the third clutch component (89) arranged between the first and second clutch components (87, 88) is formed by a transmitting roller (91); and said transmitting roller (91), the latter being eccentrically supported and adjustable from a switching position in which it is disengaged, into a switching position in which it is engaged, and drive-connected in the latter switching position with coupling surfaces (90, 93) of the first drive-connected with the first and the second clutch components (87 and 88, respectively); or one of the coupling surfaces (90; 93) of the first and second clutch components (87; 88) is formed eccentrically to the longitudinal center axis (56) of the roller axle (20) of the first clutch component (87).

29. The roller arrangement according to claim 28, wherein the roll-like transmitting roller (91) is supported on the setting lever (14) capable of swiveling around the roller axle (20), said setting lever being connected with a rod-shaped switching element (27) rotationally supported in a bore (98) in the roller axle (20), and transmitting the switching force exerted by the setting device (13).

30. The roller arrangement according to claim 28, wherein the hollow-cylindrical, roll-like transmitting roller (91) is rotationally supported on a pivot bushing (97); the latter is adjustably, particularly slidably arranged on an eccentric bushing (96) secured on the roller axle (20), and adjustable in the peripheral direction of the eccentric bushing, and connected with a rod-shaped switching element (27) rotationally supported in a bore (98) in the roller axle (20), and transmitting the switching force exerted by the setting device (13).

31. The roller arrangement according to claim 28 or 30, wherein the outside diameter of the transmitting roller (91) is dimensioned slightly smaller than the inside diameter of the driving and conveying rollers (9; 10, respectively).

32. The roller arrangement according to claim 31, wherein the driving roller (9) comprises a recess (92) forming the second clutch component (88), said recess having a coupling surface (93) concentrically to the longitudinal center axis (56) of the roller axle (20).

33. The roller arrangement according to any one of claims 28 to 32, wherein the angle of swivel (115) limiting the distance of adjustment of the transmitting roller (91) and measured between the engaged and the disengaged switching positions, amounts to between 10° and 30°, particularly between 15° and 25°, e.g. to 17°.

34. A stowing roller conveyor (1) with a multitude of rollers (6, 9, 10) mounted in a support frame (2) and assigned to several conveying zones (5a to 5d), with a roller arrangement (7) being arranged in each conveying zone (5a to 5d), such roller arrangement being coupled with additional rollers (6) of the same conveying zone (5a to 5d), wherein the roller arrangement (7) is formed according to any one of claims 1 to 33.